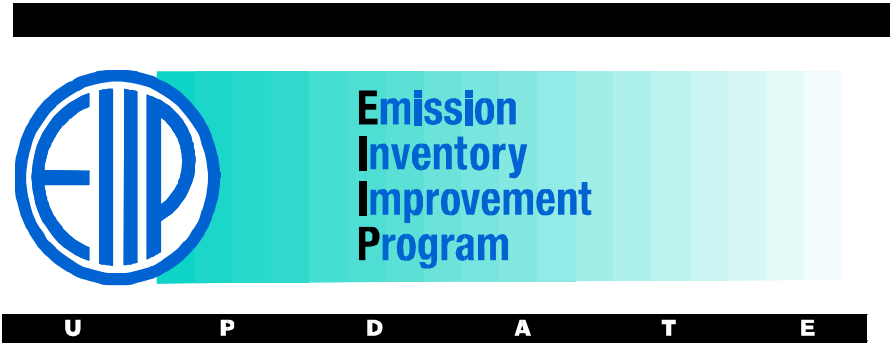


EIIP—The Leading Edge in Emissions Estimation

This issue of *EIIP Update* will begin a series of in-depth examinations of each of the EIIP working committees. The Data Management Committee (DMC) is

featured in this issue as well as the next. The major goal of the DMC has been to develop protocols to facilitate exchange of emissions information between data generator and data user. To accomplish this task, the committee has had to rethink, and in some cases reinvent, many of the basic assumptions about data element relationships and data exchange. The information in this issue begins to present the rationale for the approach selected for a standard data transfer format and transfer procedure as well as the products that have resulted from this three-year effort.

Who Should Read *EIIP UPDATE. . .*

Emission inventories influence decisions made throughout an environmental agency. Thus, it is incumbent on those that use emissions information to appreciate its strengths and limitations. Understanding the products of EIIP will enable not only **Emission Inventory** developers, but those in **Title I, Title II, Title III (Toxics), Title V, and Enforcement** programs to better use inventory data. Those in the **Data Management** organization should understand and make preparations to participate in the innovative procedures being developed by EIIP for exchanging emissions data.

The Latest Developments

EIIP Home Page Changes Address

The EIIP Home Page has changed its address from that announced previously. The new (and presumably permanent) address is **"www.epa.gov/oar/oaqps/eiip."**

Point your Net browser to the new location for the latest information.

FY97 EIIP Budget Approved by STAPPA/ALAPCO

STAPPA/ALAPCO authorizes expenditures of state and local agency Section 105 grant funds to support EIIP. The program started in FY94 with an approved budget of $750,000 per year for three years. During FY96, a request was made that STAPPA/ALAPCO extend its funding support for the EIIP.

This extension has been granted and EIIP will operate during FY97 with a budget of $675,000. The effort spent on EIIP activities is considerably more than that reflected by approved budgets, both past and present. In-kind services by all committee members (representing state and local agencies, industry, and EPA) increases the effort substantially.

EIIP Update to Change Distribution Format

This issue of *EIIP Update* is the next to last to be published in hardcopy form. Because of the costs to duplicate and distribute, the next issue will be the last to be printed and mailed. Future *EIIP Update* issues will be accessible from the EIIP Home Page (This issue as well as the September issue are also available on the Home Page).

Committee Spotlight: Data Management

Goals and Aspirations

One of the key areas identified in the Emission Inventory Improvement Program concerns the transfer of air environmental data. This has been an important issue for years, but its importance has significantly increased with the requirements of the 1990 Clean Air Act Amendments. The Data Management Committee (DMC) was formed to address these data transfer issues.

The goal of the DMC is to develop and facilitate an improved data exchange mechanism for state and local agencies, EPA, and industry. The DMC is not producing a database system but, rather, a standard data transfer format and transfer procedure that are independent of the databases that are exchanging the inventory data. Most data trading partners maintain their own in-house data systems and prefer the responsibility of maintaining those systems for their

specific program functions. Because of the many different emission inventory systems that exist and therefore potentially different database structures, standardization of the inventory data elements, their meaning, and their relationships is necessary. The initial efforts of the DMC are focused on the transfer of data to and from EPA and the state and local agencies, and between state and local agencies. The DMC plans to coordinate additional phases of development that will address the transfer of data between industry and state and local agencies. The additional development is projected to focus initially on permit-related data. The DMC is taking a completely fresh look at how air emissions-related data should be structured to provide for all the data needs of the pollution control agencies and to provide for a better and common method to exchange these data.

The goals of the DMC made it clear that to be successful its members needed to represent the air community at large that works with emissions data. The DMC was therefore formed from staff working for EPA, state and local agencies, and industry. This mixture of perspectives has been invaluable to the efforts of the

DMC.

Products by the DMC will be provided to assist the EIIP user community in implementing the recommended data transfer procedures. In addition, Section 105 grant funding has been set aside, and is available through the EPA Regions, to support state and local agencies in the EIIP "Data Delivery." These resources will be described in detail below and in future *EIIP Update* issues.

Standardizing Data Transfer

The DMC quickly identified that the key to attaining the goal of exchanging data within the air emissions community was to first develop a data model standard. This data model standard would provide the basis upon which a standard method of electronic exchange could be built. The data model standard would also ensure that any air emissions database containing the data elements and the data relationships of the standard model could easily utilize any standard developed for exchange.

It is important here to define the distinction between a database and a data model. A database, such as the Aerometric Information Retrieval System (AIRS), is a computer implementation in full, or in part, of a data model. A data model, on the other hand, defines the different data elements and the relationship that each of these data elements has with one another. The DMC wanted to avoid prescribing a particular database, and instead wanted to define a common data model that would set the standard for data exchange. This will allow a variety of databases, and even data models, to be used by the air emissions community as long as they contain the elements and relationships of the data model standard.

This emissions data model standard must encompass point, area, mobile, and biogenic sources of emissions. The data model must also contain all the necessary data elements to provide for the
shared uses that EPA and state and local agencies have which include baseline inventories, State Implementation Plan (SIP) planning, attainment

demonstration modeling, air quality trend analyses, and public information.

Since the DMC would be prescribing a specific method for the electronic exchange of data, the committee decided that this method should meet the following specific criteria:

- Be based on already established national standards for data exchange;
- Be software and computer platform independent; and
- Use established vendor and consultant support.

These criteria led to choosing a technology standard already embraced by EPA, other government sectors, and industry--the X12 implementation of Electronic Data Interchange (EDI). For the last 15 years, the EDI X12 standard has been used most extensively for financial transactions, and more recently has been used for the exchange of laboratory and sampling results. Utilizing a consultant with experience in X12, the DMC has determined that existing X12

formats can be used to implement exchange of air emissions data. Using X12 meets the criteria of the DMC and minimizes the work effort needed by utilizing an existing, fully functional standard.

The EIIP Data Model

The data model standard, as the DMC initially envisioned, would encompass all aspects for which sharing of air emissions inventory information is needed by EPA and state and local agencies. It was quickly realized that this could include a very large variety of uses ranging from permitting, emission reduction credits, and open market trading to emission cap and trade programs, etc. The DMC decided to limit its initial effort to achieve electronic exchange of the data to the more traditional purposes for which shared emission inventories are used, such as baseline inventories for SIPs, attainment demonstration modeling, and air quality strategy development. The other uses could then be undertaken as appropriate in future phases of the DMC's work.

The other EIIP technical committees (i.e., Point, Area, Mobile, and Biogenic Sources Committees) worked with the DMC and its contractor to identify the necessary data elements. In reviewing the data elements needed for point, area, mobile, and biogenic inventories, the DMC recognized the similarity in much of these data. This resulted in devoting a great deal of effort to developing a single core data model that could serve all of these inventory types. It was learned, however, that subtle but important differences among the inventory types would result in a more complicated and confusing data exchange format. Therefore, four different, but closely related data models were developed for each of the inventory types. Although the DMC decided to separate the data models for clarity, implementation of these data models could be achieved by a single data transfer standard or database.

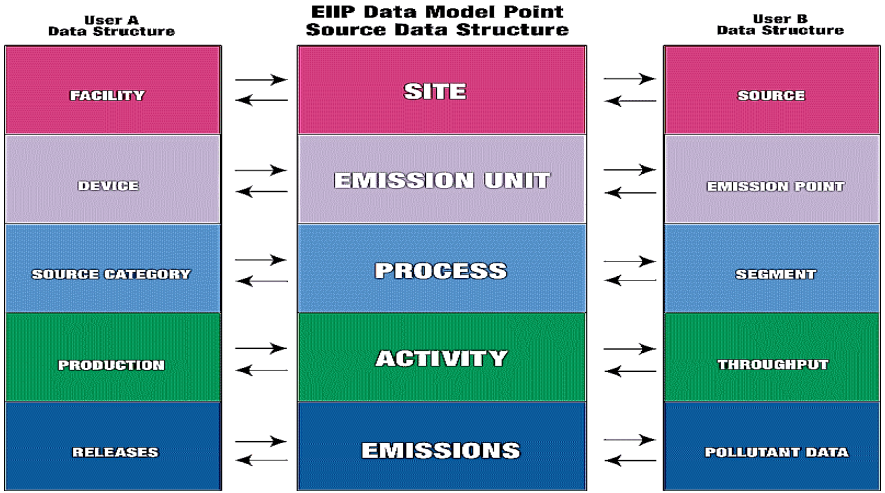
Many of the state and local agency personnel as well as staff from the EPA AIRS team, working with the DMC, tested these data models and the data relationships therein. The test was to "map" their emission inventory data from their systems to the EIIP data structure to see if the independent data structures were compatible with one another. The DMC wanted to validate that the data

relationships in the EIIP data model made sense and would remain true across independent emission inventory systems. The concept of data mapping in the context of the EIIP data model is illustrated in Figure 1. This exercise produced many iterations of the EIIP data model until it became stable this fall. The DMC and others that participated in this exercise were confident enough in the outcome of the data model development that it pursued the follow-on task of developing the standard data transfer format. Subsequent work on developing the X12 EDI format has also brought about some important changes and improvements to the data model standard.

The draft EIIP data model is now available for external peer review on EIIP's World Wide Web Home Page (www.epa.gov/oar/oaqps/eiip) and EPA's Technology Transfer Network (TTN) by selecting the Clearinghouse for Inventories/Emission Factors (CHIEF) bulletin board. The TTN/CHIEF bulletin board can be accessed via modem (dial-up number 919-541-5742) or via the TTN Home Page (ttnbbs.rtpnc.epa.gov). Public and peer review of the data model standard will likely result in some additional changes to the data model standard. The ultimate test of the air data model will be the successful

exchange of data using the EDI X12 technology. This testing will begin with some limited pilot projects undertaken by volunteer state and local agencies. Upon successful demonstration at the pilot level, the X12 EDI data exchange formats will be made available to the air emissions community at large.

Figure 1. Data Management Committee EIIP Data Model Standard
The Solution to Different Data Structures



In the Next Mailing

The next *EIIP Update* will continue describing the Data Management Committee programs. Concluding articles in the next issue will complete the description of how EIIP data management efforts will facilitate data exchange efforts in the future. REMEMBER: The next *EIIP Update* will be the last issue published and mailed in hardcopy form.

More Recent Developments

New Documents Available

Several new procedures have been finalized or are undergoing external review since the last issue of *EIIP Update*. These are listed below and can be found on the EIIP Home Page (www.epa.gov/oar/oaqps/eiip/) under the appropriate

committee heading and on the CHIEF bulletin board (TELNET ttnbbs.rtpnc.epa.gov).

Area Sources Committee

- Chapter 1: Introduction (completed)
- Chapter 7: Graphic Arts (final)

Mobile Sources Committee

- Use of Locality-Specific Transportation Data for the Development of Mobile Source Emission Inventories (completed)

Quality Assurance Committee

- Chapter 5: Model QA Plan (completed)

Data Management Committee

- Chapter 1: EIIP Phase I Data Model (in external review)

EIIP Contact List

Steering Committee	
Steve Bromberg (EPA)	(919) 541-1000
Roger Westman (Allegheny County Health Department)	(412) 578-8103
Point Sources Committee	
Dennis Beauregard (EPA)	(919) 541-5512
Bill Gill (Texas Natural Resources Conservation Commission)	(512) 239-5750
Area Sources Committee	
Chris Nguyen (California Air Resources Board)	(916) 322-7141

Charles Mann (EPA)	(919) 541-4593
Mobile Sources Committee	
Rob Altenburg (Pennsylvania Bureau of Air Quality)	(717) 787-4310
Greg Janssen (EPA)	(313) 668-4285
Biogenic Sources Committee	
Tom Pierce (EPA)	(919) 541-1375
Quality Assurance Committee	
William Kuykendal (EPA)	(919) 541-5372
Tom Ballou (Virginia Department of Environmental Quality)	(804) 698-4406

Data Management Committee	
John Slade (Pennsylvania Department of Environmental Resources)	(717) 783-9476
Lee Tooly (EPA)	(919) 541-5292
Bill Benjey (EPA)	(919) 541-0821
Governmental Interactions Committee	
Thomas M. Allen (New York Department of Environmental Conservation)	(518) 457-7230
Dave Mobley (EPA)	(919) 541-4676